

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Nowak et. al.

Docket No.: 053649-0003

Title: COMPOSITE WRAP MATERIAL

Assistant Commissioner for Patents

PATENT APPLICATION

Washington, D.C. 20231

TRANSMITTAL OF UTILITY PATENT APPLICATION UNDER 37 CFR 1.53(b)

Utility Patent Application:

8 Pages of specification; 4 Pages of claims; 1 Page of Abstract

1 Sheets of drawings: ☒ informal ☐ formal

2. ☐ This is a ☐ Continuation ☐ Divisional ☐ Continuation-in-part (CIP) of prior application Serial No. ___/___, filed on ____, and entitled ____, the entire disclosure of which is hereby incorporated by reference herein.

☐ Preliminary Amendment is enclosed. The fee for excess claims has been calculated below.

☐ Cancel in this application, claims ___-___ of the prior application (at least one claim retained), before calculating the filing fee below.

3. ☒ **Combined Declaration/Power of Attorney:**

☐ newly executed ☒ unsigned

☐ copy from prior application for Continuation/Divisional (37 CFR § 1.63(d)(1))

☐ The application is being filed by less than all inventors named in the prior application. Delete the following inventor(s) named in the prior application (37 CFR § 1.63(d)(2)):

(GIVEN NAME)

(MIDDLE INITIAL OR NAME)

FAMILY (OR LAST NAME)

4. ☒ **Additional Papers** enclosed:

☒ A return postcard.

☐ Assignment of the invention to: _____ ☐ Cover Sheet for Assignment.

☐ Information Disclosure Statement ☐ Form 1449 ☐ Copy of IDS Citations

☐ Certified copy of Priority Document as a _____ application, Serial No. _____, filed _____, 199__.

5. **Fee Calculation** (37 CFR 1.16).

CLAIMS AS FILED			SMALL ENTITY		OR	OTHER THAN SMALL ENTITY	
FOR	NUMBER FILED	NUMBER EXTRA	RATE	FEE		RATE	FEE
BASIC FEE				\$ 395	OR		\$ 790
TOTAL CLAIMS	17 minus 20 =	0	X \$ 11 =	\$ 0	OR	X \$ 22 =	\$
INDEPENDENT CLAIMS	3 minus 3 =	0	X \$ 41 =	\$ 0	OR	X \$ 82 =	\$
MULTIPLE DEPENDENT CLAIMS PRESENT (37 CFR 1.16(d))			+ \$ 135 =	\$ 0	OR	+ \$ 270 =	\$
			TOTAL	\$ 395	OR	TOTAL	\$

6. **Payment of Fees:** ☒ check in the amount of \$ 395.00.

☐ fees are being deferred.

☐ charge Deposit Account No. 07-1509. A duplicate copy of this sheet is enclosed.

7. ☒ Please charge any additional fees or credit overpayment to Deposit Account No. 07-1509. (Does not apply if fees are deferred).

8. ☐ A verified statement to establish small entity status:

☐ is enclosed. ☐ a copy is enclosed which was filed in the previous application, and still applies.

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COMPOSITE WRAP MATERIAL

FIELD OF THE INVENTION

5 The present invention relates to composite wrap materials for use as a protective covering in a variety of applications, and methods of making the composite wrap materials. More particularly, the invention relates to composite wrap materials used for packaging paper products.

10

BACKGROUND OF THE INVENTION

 Reams of paper for copy machines, computers, and other applications, are found in retail stores packaged in various composite or non-composite wrap materials. In addition to keeping the paper contained in the package, the wrap provides a moisture barrier that prevents or delays the absorption of moisture by the wrapped paper. The
15 wrap also presents the paper contained inside in an eye appealing manner to the consumer.

 Conventional commercial wrappers include paper\polyethylene\paper laminates, paper\wax\paper laminates, polyethylene-coated papers, wax-coated papers, and transparent polymer films. A drawback of paper-based wrap materials is their low
20 burst strength. Oftentimes, such packages tend to break open before reaching the consumer because the wrapper is not strong enough to hold the paper upon repeated handling and stacking on store shelves. This not only ruins the product by causing an

unsightly appearance on a store shelf, but can damage the paper which can cause copiers and printers to become jammed.

A disadvantage of film-based wrap materials that do not contain paper is that they are difficult to run on conventional packaging equipment during the wrapping
5 process and require costly modifications to a paper packaging line. In addition, film-based wrap materials has a low burst strength, and lack the structural support of the heavier weight paper structures.

Another disadvantage of known wraps is that they process either like paper or film, depending on their major component. While providing a good dimensionally
10 stable print surface, paper does not provide the gloss or the ink holdout of film structures. Film, while providing gloss and ink holdout, is more flexible and much more difficult to handle than paper due to its stretch properties.

As store distribution of such paper products has increased, paper companies have wanted to improve the graphics on the packaging for greater shelf appeal, and
15 increase the strength of the wrappers to dependably contain a ream of paper until opened by the consumer.

Therefore, an object of the invention is to provide a composite wrap material that can be used to wrap a ream of paper or other material to provide a wrapped package having high burst strength. Another object is to provide a composite wrap
20 material that will provide a barrier against moisture absorption by the wrapped contents. Another object is to provide a composite wrap material having the fold characteristics of paper. Yet another object is to provide a composite wrap material that can have a high gloss print surface or a standard paper print surface as desired. A

further object is to provide a composite wrap material that can be provided in various forms according to different applications.

SUMMARY OF THE INVENTION

5 These and other objects and advantages are achieved in the present composite wrap material, a process of making the wrap material, and use of the wrap material to package paper and other materials.

 The composite wrap material of the invention is composed of a layer or sheet of a paper or cellulosic material and a layer of a polymer film material that are integrally
10 bonded together by means of an adhesive layer interposed thereinbetween. The polymer film layer and/or the adhesive layer function to provide a moisture vapor barrier to protect the contents packaged within the wrap material.

 The wrap material can provide a clear or transparent wrap such that a consumer can see the paper layer laminated to the polymer film layer. One or more layers can
15 optionally contain a pigment to provide coloration. The wrap can also be provided with a high gloss print surface or a standard paper print surface. In another variation, the paper material and/or the polymer film can be a metalized material. In addition, the paper material can be printed before lamination so that the print shows through the film layer.

20 The composite paper/film wrap material can be prepared by laminating a three-layer structure composed of the layer of paper, the adhesive layer, and the polymer film layer, using a nip roller apparatus or other suitable laminating device. The paper and polymer film layers with the adhesive layer thereinbetween can be passed through a

pair of nip rollers to bond the two layers together. The processing temperature can be maintained to control the processing temperature of the adhesive material.

Advantageously, the resulting composite wrap facilitates high burst strength of the final package, the option of a high gloss print surface or a standard paper print surface, a moisture barrier to prevent moisture absorption by the wrapped paper, and the fold characteristics of paper.

BRIEF DESCRIPTION OF THE DRAWINGS

Throughout the following views, reference numerals will be used in the drawings, and the same reference numerals will be used throughout the several views and in the description to indicate same or like parts of the invention.

FIG. 1 is a cross-sectional view of a composite wrap material according to the invention; and

FIG. 2 is a schematic view of an apparatus used to produce the composite wrap material of **FIG. 1**.

DESCRIPTION OF THE INVENTION

Referring now to the drawings, an embodiment of a composite wrap material of the invention according to the invention, generally designated with the numeral 10, is shown in cross-section in **FIG. 1**.

The composite wrap material 10 is made of a first layer 15 composed of a cellulosic material, a second layer 20 composed of a polymer-based film material, and an adhesive layer 25 positioned between the first and second layers. The present

composite wrap material has an increased strength compared to conventional wrap materials, and is particularly effective in maintaining the integrity of a ream of paper packaged within the wrap material during handling.

5 The first layer 15 of the wrap material 10 can be any material composed primarily of cellulosic fibers. Suitable materials for use as the first layer 15 include, for example, machine-finished or machine-glazed paper, tissue paper, non-woven tissue paper, air-laid fabric, wet-laid fabric, and wet or dry creped tissue, or other types of paper. An exemplary material for the first layer 15 is a paper having good fold retention with a basis weight of about 5-80 lbs. per 3,000 sq. ft., preferably about 10 20-60 lbs. per 3,000 sq. ft. The caliper of the first layer 15 is such that the material can be readily run through a conventional wrapping apparatus used to package reams of paper.

15 The second layer 20 of the composite wrap material 10 is a polymer film material that, when bonded to the first layer 15 will increase the strength of the cellulosic material, and/or provides a high gloss surface over the first layer 15. Such materials include continuous polymer surfaces, for example, films of polyethylene, polypropylene including oriented polypropylene, poly(ethylene terephthalate) such as Mylar® polyesters, nylon, ionomer resin such as Surlyn® ionomer resins, polyester, and non-continuous, non-woven webs made of fibers composed of those polymer materials.

20 An adhesive layer 25 is interposed between the first and second layers 15, 20. The adhesive is typically in the form of a liquid or flowable material. Examples of useful adhesives include wax/polymer blends, polyethylene, polypropylene, polyvinylidene chloride, polyethylene acrylic acid, polypropylene, polyester,

polyisobutylene, nylon, polymethylpentene, ethylene vinyl acetate, and copolymers thereof. Also useful are hot-melt adhesives, and wax/polymer blends. Such adhesive materials are further described in *The Handbook of Adhesives*, I. Skeist (ed.), 2d edition, Van Nostrand Reinhold Company, New York (1977), and *Adhesives*

5 *Handbook*, J. Shields, Newnes-Butterworths, London (1976).

The polymer-based film second layer 20, and/or the adhesive layer 25, alone or in combination, form a moisture vapor barrier to inhibit the absorption of moisture by the paper or other material contained inside the wrapper. This helps protect a paper product from curling or warping.

10 Optionally, one or more of the three layers 15, 20, 25, of the composite wrap material can include a coloring agent to provide a transparent, or an opaque colored wrap material to mask the product contained within. Examples of coloring agents that will impart a transparent coloring effect include organic pigments such as a monazo pigment (Lake Red C, Nickel Azo Yellow), a diazo pigment (Benzidine Yellow),
15 phthalocyanine pigments, and fluorescent pigments, among others. Coloring agents that will impart opacity include, for example, inorganic pigments such as titanium dioxide or barium sulfate (white), a metallic oxide pigment such as an iron oxide, zinc oxide or chromium oxide greens, ultramarine pigments, cadmium pigments, and pearlescent pigments, among others. A thin layer of metal can also be used as a
20 pigment coating.

In use, one side of the wrap material is placed next to the paper or other material being wrapped. The other side of the wrap material may be printed upon

using known printing techniques, or the paper layer 15 or film layer 20 can be printed before lamination, and then laminated so the print shows through the film layer.

The densities of the paper layer 15 and the polymer film layer 20 of the composite wrap material 10 can be varied to control the performance of the final structure on the packaging equipment.

The composite wrap material 10 can be prepared, for example, by extrusion lamination as schematically depicted in FIG. 2. The laminating device 30 includes two nip rollers 40, 45 that rotate in opposite directions, as shown by arrows 50, 52. Prior to passing through the nip rollers 40, 45, the paper layer 15 and film layer 20 are directed into an adjacent, non-contact position using known techniques. The adhesive material 25 is applied to the paper layer 15 and/or the film layer 20 in close proximity to the nip rollers. Preferably, the adhesive material 25 initially contacts one of the layers 15, 20 prior to passing into the nip rollers. As the layers 15, 20, 25, pass through the nip rollers 40, 45 in the direction of arrow 54, the three layers contact for the first time to form a three-layered wrap material 10. Preferably, the composite wrap material 10 is prepared such that the first and second layers 15, 25 are continuously bonded together with substantially no air pockets thereinbetween.

The temperature of the rollers 40, 45 can be varied according to the processing temperature of the adhesive material and the processing contact time. One or both of the rollers 40, 45 can be maintained at a temperature to cool and set the adhesive 25 as required. In a typical set-up, the surface temperature of the roller 45 is controlled for cooling the adhesive. In passing the two sheets 15, 20, and adhesive layer 25 through

WHAT IS CLAIMED IS:

1. A composite wrap material, comprising:
 - a) a first layer composed of paper;
 - b) a second layer composed of a polymer film material; and
 - c) an adhesive layer between the first and second layers,wherein the first and second layers are integrally bonded together by the adhesive layer, and the polymer film layer, the adhesive layer, or a combination of both provide a moisture vapor barrier.
2. The composite wrap material according to Claim 1, wherein the first and second layers are continuously bonded together such that there are substantially no air pockets thereinbetween.
3. The composite wrap material according to Claim 1, wherein the first layer is composed of a cellulosic material having fold retention and a basis weight of about 5-80 lbs./3,000 sq. ft.
4. The composite wrap material according to Claim 1, wherein the first layer is composed of a cellulosic material having fold retention and a basis weight of about 20-60 lbs./3,000 sq. ft.

5. The composite wrap material according to Claim 1, wherein the first layer is composed of a cellulosic material selected from the group consisting of machine finished paper, machine glazed paper, tissue, tissue, air laid fabric, wet laid fabric, creped tissue, and a metalized paper.
6. The composite wrap material according to Claim 1, wherein the second layer is composed of a polymer material selected from the group consisting of polyethylene, polypropylene, poly(ethylene terephthalate), , nylon, ionomer resin, and polyester.
7. The composite wrap material according to Claim 1, wherein the second layer is a non-continuous, non-woven web comprised of fibers of a polymer material selected from the group consisting of polyethylene, poly(ethylene terephthalate), polypropylene, nylon, ionomer resin, and polyester.
8. The composite wrap material according to Claim 1, wherein the adhesive layer is composed of a polymer material selected from the group consisting of polyethylene, polypropylene, polyvinylidene chloride, polyethylene acrylic acid, polyester, polyisobutylene, nylon, polymethylpentene, and ethylene vinyl acetate, and copolymers thereof.
9. The composite wrap material according to Claim 1, wherein the adhesive layer is composed of a wax/polymer blend.

10. The composite wrap material according to Claim 1, wherein the adhesive layer is composed of a hot-melt adhesive.

11. The composite wrap material according to Claim 1, wherein one or more of the layers are pigmented.

12. The composite wrap material according to Claim 1, wherein a surface of the first or second layer is composed of a metalized material.

13. A process for making a composite wrap material, comprising:

- a) providing a first sheet of a cellulosic material, a second sheet of a polymer film, and an adhesive material;
- b) applying the adhesive material to a surface of the first sheet, the second sheets, or both;
- c) conveying the first and second sheets into a laminating apparatus, with the adhesive material interposed between the first and second sheets;
- d) laminating the two sheets to bond the first and second layers together and form an integral composite wrap material.

14. The process according to Claim 13, wherein step b) further comprises: maintaining the temperature of the laminating step at the processing temperature of the adhesive material.

15. A ream of paper wrapped together as a package with a sheet of the composite wrap material of Claim 1, wherein the composite wrap provides a high burst strength of the packaged paper.

16. The ream of paper according to Claim 15, wherein the composite wrap material provides a barrier to effectively prevent moisture absorption and curling of the packaged paper.

17. The ream of paper according to Claim 15, wherein the composite wrap material has the fold characteristics of paper.

COMPOSITE WRAP MATERIAL

ABSTRACT OF THE INVENTION

A composite wrap material is provided for use in wrapping reams of paper and other materials. The wrap material is composed of a paper layer and a polymer film layer that are integrally bonded together by an adhesive layer interposed between the two layers. Also provided is a method of making and using the wrap material.

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By: Kristine M. Strodthoff

Name: Kristine M. Strodthoff

MW2-155613-1

**United States Patent Application
COMBINED DECLARATION AND POWER OF ATTORNEY**

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name. I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled: COMPOSITE WRAP MATERIAL

the specification of which:

(a) ☒ is attached hereto.

(b) ☐ was filed on _____ as Serial No. _____

for which I solicit a United States patent.

ACKNOWLEDGMENT OF REVIEW OF PAPERS AND DUTY OF CANDOR

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above. I acknowledge the duty to disclose information which is material to patentability as defined in 37 Code of Federal Regulations § 1.56, and which is material to the examination of this application, namely, information where there is a substantial likelihood that a reasonable examiner would consider it important in deciding whether to allow the application to issue as a patent (see last page attached hereto).

PRIORITY CLAIM (35 U.S.C. § 119)

I hereby claim foreign priority benefits under Title 35, United States Code, § 119/365 of any foreign application(s) for patent or inventor's certificate or of any PCT international application(s) designating at least one country other than the United States of America listed below and have also identified below any foreign application(s) for patent or inventor's certificate or any PCT international application(s) designating at least one country other than the United States of America filed by me on the same subject matter having a filing date before that of the application(s) of which priority is claimed, or a provisional application filed under § 111(b) of Title 35 (35 U.S.C. § 119(b)).

☒ no such applications have been filed.

☐ such applications have been filed as follows.

FOREIGN/PCT or PROVISIONAL APPLICATION(S) FILED WITHIN 12 MONTHS (6 MONTHS FOR DESIGN) PRIOR TO THIS APPLICATION, CLAIMING PRIORITY UNDER 35 U.S.C. § 119

COUNTRY (OR INDICATE IF PCT)	APPLICATION NUMBER	DATE OF FILING (day, month, year)	PRIORITY CLAIMED UNDER 37 USC § 119
			<input type="checkbox"/> YES <input type="checkbox"/> NO

FOREIGN/PCT APPLICATION(S) FILED BEFORE THE PRIORITY APPLICATION(S)

COUNTRY (OR INDICATE IF PCT)	APPLICATION NUMBER	DATE OF FILING (day, month, year)	DATE OF ISSUE

PRIORITY CLAIM (35 U.S.C. § 120/365)

I hereby claim the benefit under Title 35, United States Code, § 120/365 of any United States and PCT International application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, § 112, I acknowledge the duty to disclose material

information as defined in Title 37, Code of Federal Regulations, § 1.56(a) which occurred between the filing date of the prior application and the national or PCT international filing date of this application.

U.S. APPLICATION NUMBER	DATE OF FILING (day, month, year)	STATUS (patented, pending, abandoned)

POWER OF ATTORNEY

I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith.

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Adam L. Brookman; Reg. No. 32,401
Derek C. Stettner; Reg. No. 37,945
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DECLARATION

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Full name of first inventor

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Inventor's signature: _____ Date _____

RULE 56 (37 U.S.C. §1.56)

(a) A patent by its very nature is affected with a public interest. The public interest is best served, and the most effective patent examination occurs when, at the time an application is being examined, the Office is aware of and evaluates the teachings of all information material to patentability. Each individual associated with the filing and prosecution of a patent application has a duty of candor and good faith in dealing with the Office. This includes a duty to disclose to the Office all information known to that individual to be material to patentability as defined in this section. The duty to disclose information exists with respect to each pending claim until the claim is canceled or withdrawn from consideration, or the application becomes abandoned. Information that is material to the patentability of a canceled or withdrawn claim need not be submitted if the information is not material to the patentability of any of the remaining claims. There is no duty to submit information that is not material to the patentability of any existing claim. The duty to disclose all information known to be material to patentability is deemed to be satisfied if all information known to be material to patentability of any claim issued in a patent was cited by the Office or submitted to the Office in the manner prescribed by 37 C.F.R. §§ 1.97(b)-(d) and 1.98. However, no patent will be granted on an application in connection with which fraud on the Office was practiced or attempted or the duty of disclosure was violated through bad faith or intentional misconduct. The Office encourages applicants to carefully examine:

- (1) prior art cited in search reports of a foreign patent office in a counterpart application, and
- (2) the closest information over which individuals associated with the filing or prosecution of a patent application believe any pending claim patentably defines, to make sure that any material information contained therein is disclosed to the Office.

(b) Under this section, information is material to patentability when it is not cumulative to information already of record or being made of record in the application, and

- (1) It establishes, by itself or in combination with other information, a prima facie case of unpatentability of a claim; or
- (2) It refutes, or is inconsistent with, a position the applicant takes in:
 - (i) Opposing an argument of unpatentability relied on by the Office, or
 - (ii) Asserting an argument of patentability.

A prima facie case of unpatentability is established when the information compels a conclusion that a claim is unpatentable under the preponderance of evidence, burden-of-proof standard, giving each term in the claim its broadest reasonable construction consistent with the specification, and before any consideration is given to evidence which may be submitted in an attempt to establish a contrary conclusion of patentability.

(c) Individuals associated with the filing or prosecution of a patent application within the meaning of this section are:

- (1) Each inventor named in the application;
- (2) Each attorney or agent who prepares or prosecutes the application; and
- (3) Every other person who is substantively involved in the preparation or prosecution of the application and who is associated with the inventor, with the assignee or with anyone to whom there is an obligation to assign the application.

(d) Individuals other than the attorney, agent or inventor may comply with this section by disclosing information to the attorney, agent, or inventor.